

Dr. Konen's chapter on fluorescence is again admirable, and is also prefaced with an historical section, from which may be gathered the interesting information that the first mention of fluorescence is an account which Robert Boyle found in a Spanish manuscript dated 1570 of an aqueous extract of some wood.

The second section of this chapter deals with the so-called bright-line fluorescence spectra, including, of course, the work on iodine and Prof. R. W. Wood's new work on sodium vapour. This opens the question as to what is meant by fluorescence, for it would seem that the phenomena of bright-line spectra obtained with iodine and sodium vapours are of a different order from the true fluorescence of organic compounds. Wood's more recent work would certainly go far to show that his results are those of optical resonance pure and simple. On the other hand, the real fluorescent phenomena of organic chemistry are of a very different nature. They are undoubtedly due to a certain complexity of structure; they undoubtedly require a linking together within the molecule of a definite number of centres of unsaturation (used in the chemical sense). Conversely, a simplification of the molecular structure tends to decrease the power to fluoresce. The two phenomena must therefore be of different type, and for this reason it would be preferable to treat the bright-line phenomena under a separate heading of resonance spectra, leaving the term fluorescence to the more complicated molecular phenomena of organic chemistry.

Following on the section upon bright-line fluorescence there are sections dealing with ordinary band fluorescence spectra, the method of investigation, the absorption and emission of fluorescing substances, the influence of temperature, of the solvent, and of the wave-length of the exciting light, and, finally, two sections dealing with the relation between fluorescence and chemical constitution, and also with general theories. A list of substances is added which are known to exhibit fluorescence, a list which, though far from complete, is a very useful addendum. This list brings to conclusion a volume which is a worthy follower of the three volumes which have preceded it.

POPULAR ORNITHOLOGY.

- (1) *A Bird Collector's Medley.* By E. C. Arnold. Pp. iv+144; with 12 coloured and 8 collotype plates and illustrations in the text. (London: West, Newman and Co., 1907.) Price 10s.
 - (2) *Birds of Britain.* By J. Lewis Bonhote. Pp. x+405; with 100 illustrations in colour. (London: Adam and Charles Black, 1907.) Price 20s. net.
 - (3) *A Book of Birds.* By W. P. Pycraft. Pp. viii+155; with 30 full-page coloured plates and illustrations in the text. (London: Sidney Appleton, 1908.) Price 6s. net.
- (1) M R. ARNOLD has been known for several years past in the bird world as an enthusiastic shore-shooter who has been lucky enough in recent years to secure examples of several migratory birds which have very rarely been known to straggle to these

shores, and, indeed, to add two species to the British list. He very ably justifies the killing of these rare migrants on the grounds that they are abnormal wanderers which would never settle in England, and adds that it seems far better that they should be carefully preserved for the benefit of those who would otherwise never see them rather than be observed through glasses by one individual for the space of perhaps half an hour at the outside. His introductory chapter is mainly taken up by a forcible defence of the amateur collector, who, he very truly says, is abused by books, periodicals, newspapers, and those very ladies who adorn their bonnets with stuffed terns and bullfinches. What is more contemptible is the attitude of "some eminent naturalist, who has possibly amassed a fine private collection in his youth, and has now taken up the fashionable cry." We were reminded of the truth of this "reprisal" upon reading quite recently a review of this very book. A chapter on bird-protection deserves careful perusal. It is an able summary of the whole matter, so far as it concerns this country, and contains more common-sense and less rubbish (we had almost written hypocrisy) than any other disquisition on the subject we have met with for a long time. For the rest, the book is chiefly an account of the author's personal experience as a field ornithologist and collector in many and varied parts of the British Islands, and contains many very interesting notes and observations.

One of the best chapters relates the experience of a dunlin, born on the fells, going down to the seashore for the winter and back to the moorlands in spring, and is very well told indeed (in the dunlin's own words). There is also a good chapter on bird-stuffing, and a medley was a good name for the book. The twenty full-page plates, the work of the author, portray some pleasing scenes in bird-life. Some also are intended to recall specimens of rare birds in the author's bird collection in the Eastbourne Institute. No one would wish to criticise their merits too closely; it is enough that for the most part they appeal to the emotions of the field ornithologist.

We must protest, however, against the plate of the two ruffs in full breeding dress fighting at their breeding grounds. Anyone who has watched ruffs on the "hill" must have been struck especially with one circumstance, viz. the great diversity in colour of the birds, and that from perhaps a dozen or so collected on the hill at one time it would be impossible to pick out two the colours and arrangement of colours of which were alike. We cannot, therefore, but regard the present picture displaying only two ruffs, and those practically as alike as two peas, as unnatural. For although such a case is not, of course, absolutely impossible, it is extremely unlikely. The various illustrations in the text are from photographs, and some of them, e.g. "Doing the Bushes," will recall days spent in that now famous spot to the minds of many birdmen. The addition of an index would have been an improvement to this nicely-got-up volume.

(2) Messrs. Adam and Charles Black have added to their series of beautiful books, with full-page illustrations in colour, a volume on "Birds of Britain." The

hundred illustrations are selected from Mr. Dresser's "Birds of Europe," and the originals, of course, are of the very best. But we can say very little for the reproductions. We see that the old faults of this kind of colour process have not, in this case at all events, been overcome. Here and there one of the colours used has asserted itself out of place or shown uncalled-for strength. On the curlew's plumage there appears a strange flush of carmine pink. This does not matter much to one who has known the curlew well for many years, and who knows that the colour is libellous. But how about "the genuine seeker after trustworthy information on British birds," who turns to the plate in order to find out how a curlew is coloured? Green, too, frequently shows itself when it is not wanted; and while colours have sometimes come out hard and crude, in other cases delicate tints have almost failed or played false, as in the legs of the reed-warbler, which do not agree in colour with the description. The barn owl is curiously blue, Richardson's skua green, and the dunlin, like several others, flushed with pink, while the head of the black-headed gull is much too bright and light a brown. Some plates are faint and indistinct.

Altogether we cannot regard this new colour book as a success. The plates have been selected so as to give examples of the most typical species. But if the book was to prove of help and service to the genuine seeker after trustworthy information on the subject, the selection might have been a more useful one. The commonest birds have not in every case been chosen, for the blue-headed appears instead of Ray's wagtail, and the mealy instead of the lesser redpoll; and it would have been better in the interests of the learner to carry this idea further, and to have illustrated some of the less common birds rather than well-known, conspicuous, and easily identified species. For instance, the blackbird, robin, goldfinch, bullfinch, chaffinch, starling, jackdaw, rook, skylark, kingfisher, kestrel, grouse, &c., might more usefully have been replaced by the woodlark, twite, siskin, brambling, grey shrike, woodchat, merlin, hobby, the harriers, shorelark, and some of the less conspicuously coloured waders and waterfowl. The guillemot in adult summer dress figured here is the variety known as the ringed guillemot. This should have been stated in order to avoid leading a beginner astray. The positions on the plate of the stormy and Leach's petrels are wrongly stated, and should be reversed.

The letter-press (which includes some account of every species of bird which has occurred in the British Islands) is of a popular character and very pleasantly written. The charming notes of the ways and habits of the birds have been taken at first hand, straight from nature, and are valuable and all the more interesting for that reason. But perhaps for this very reason they may seem sometimes to have been written from too limited a field of observation. At all events, if this were not rather a publisher's than an author's book, and more meant for the general public than for the naturalist, we might criticise some of the statements. To turn only to two species. With us the hedge-sparrow's song is certainly not

commenced in March; nor do we think the missel-thrush is so very conservative in its choice of a nesting site, or that from four to six is the usual number of eggs laid by this bird; or, again, that the missel-thrush will be found sitting on a full clutch towards the end of February in Britain generally, though it may lay in that month in the south. To continue about the same bird; after the late Prof. Newton's observations, any doubt can hardly still exist about its "supposed" fondness for mistletoe berries. As no attempt has been made to husband space by condensing information or avoiding occasional discursiveness, the account given of each species is not so comprehensive as one might expect to find in this bulky volume, but all the birds are described, as well as the eggs and nests of all except the occasional visitors.

(3) The aim of Mr. Pycraft's book is to present the reader with a general survey of the principal groups of modern birds, such as are likely to be met with in zoological gardens or in museums. Of necessity many of the less-known species do not find a place here. In no single volume would it be possible to give anything like an intelligible description of the 14,000 different species of known birds. The reader, however, will find a concise account of some of the more important facts with regard to the life-history of the birds of Great Britain and of their European relatives, as well as of a number of the more remarkable birds of other lands. To give this in about 160 pages of rather large print was, even so, to attempt too much. Too much has been attempted in a small space. The treatment is very slight. Those who know absolutely nothing about birds will doubtless learn a good deal by studying these pages; and if the book wishes to claim the merit of displaying the bird-world at little more than a glance, why, certainly, a very long book was not required. Cheapness is a great merit in a book of this kind, but may perhaps be overdone. About 160 pages of letter-press on good thick paper, and thirty coloured plates, besides wood-cuts, for six shillings is too much to expect, and something is likely to suffer. But if the plates make a critical ornithologist shudder, they will give the general reader a very fair idea of the birds they represent, and they are a marvel at the price.

OUR BOOK SHELF.

Handbook of Learned Societies and Institutions—America. Pp. viii+592. (Washington, D.C.: The Carnegie Institution, 1908.)

To the Carnegie Institution a debt of gratitude is due for the preparation of a handbook of the learned societies and institutions of the world. The present volume is the first instalment, and deals with the societies of the western hemisphere, for it includes the United States, Canada, Mexico, the West Indies, Central and South America.

The supervision of the work was entrusted by the Carnegie trustees to the Librarian of Congress, and its organisation was placed in the hands of Mr. J. David Thompson, of the library staff, who has edited the volume, the material having been compiled by Mrs. Lucy C. Daniels Thompson and Miss Mary F. Griffin. Pending decision as to further publication, the remaining material relating to societies and institu-